To: Reddy, Penny[Reddy.Penny@epa.gov]
Cc: Mulhearn, Mike[mike.mulhearn@mountainview.gov]
From: Turner, Alison
Sent: Fri 2/8/2013 11:13:49 PM
Subject: RE: Evandale - Sanitary Sewer
Standard Provisions July 1971.pdf

Hi Penny-

I searched archives concerning possible backfill material and could not find anything conclusive. My guess is that City of Mountain View followed the Caltrans specifications , but I could only go as far back as 1966. I have included the Mountain View Standard Provision dated 1971.

http://www.dot.ca.gov/hq/esc/oe/project_plans/HTM/Archive.htm

http://www.dot.ca.gov/hq/esc/oe/project_plans/Archive/1966-Book-for-Web.pdf pages 6, 8, 27, 28

Caltrans was fairly generic in their backfill requirements 1999 spec's hav eteh metric standard

http://www.dot.ca.gov/hq/esc/oe/specifications/std_specs/1999_StdSpecs/

19□3 STRUCTURE EXCAVATION AND BACKFILL

19□3.01 Description

Structure excavation shall consist of excavation for the construction of foundations for structures; excavation of trenches for the construction of culverts, pipes, rods, deadmen, cutoff walls and other facilities; other excavation designated on the plans or in these specifications or in the special provisions as structure

•□□□□□□□□□excavation; the control and removal of water and the construction or installation of cofferdams and other facilities as necessary to accomplish construction of the work; and the subsequent removal of those facilities, except when the facilities are required or permitted by the plans and specifications to remain in place.

•□□□□□□□□□ Structure backfill shall consist of furnishing, placing and compacting backfill material around structures to the lines designated on the plans or specified or directed by the Engineer.

•□□□□□□□□□ Structure excavation and structure backfill may be classified on the plans or in the Engineer's Estimate into various types or classifications. When there is a contract pay item for structure excavation (Type A), that excavation shall include all excavation for footings where seal courses are shown on the plans. The requirements of the specifications pertaining specifically to earthwork for culverts shall apply only to earthwork which is classified on the plans as structure excavation (culvert) and structure backfill (culvert).

•□□□□□□□□□ Material from structure excavation not used as structure backfill shall be deposited in roadway embankments as provided in Section 19□6, "Embankment Construction," or disposed of as provided in Section 19□2.06, "Surplus Material," all as directed by the Engineer.

19□3.02 Excavation for Culverts

•□□□□□□□□□ When the plans require embankment construction prior to culvert excavation the embankment shall first be constructed to the required height as shown on the plans, and for a distance each side of the culvert of not less than 5 times the diameter or height of the culvert, after which the trench shall be excavated and the culvert installed. Where the embankments are to be constructed on a steep slope or at a difficult location, the height of new embankments may be varied as directed by the Engineer before installing culverts.

19□3.025 Culvert Beddings

•□□□□□□□□□ Culvert beddings shall consist of shaped bedding, sand bedding, or soil cement bedding and shall be constructed, where shown or specified, in accordance with the details shown on the plans and these specifications. When more than one type of bedding is permitted, the same bedding shall be used throughout the length of the culvert.

•□□□□□□□□□ Culvert beddings shall conform to the following requirements:

19□3.025A Shaped Bedding

•□□□□□□□□□ The trench bed shall be shaped to fit the bottom of the culvert, as shown on the plans, and shall provide uniform support throughout the entire length of the culvert. The trench may be excavated below the bottom of the culvert and the shaped bedding constructed by backfilling and compacting culvert backfill material to the required line, grade and shape. Shaping shall be accomplished by use of a template conforming to the outside shape of the culvert and guided by headers set parallel to the grade of the culvert established by the Engineer. The headers may be left in place.

19□3.025B Sand Bedding

•□□□□□□□□□ Sand shall be free from clay or organic material, suitable for the purpose intended, and

shall be of such size that 90 percent to 100 percent will pass a 4.75 mm sieve and not more than 5 percent will pass a 75 µm sieve.

19 3.025C Soil Cement Bedding

- Portland cement used in soil cement bedding shall conform to the provisions in Section 90, "Portland Cement Concrete," except that testing will not be required.

- Water used for soil cement bedding shall be free from oil, salts and other impurities which would have an adverse effect on the quality of the bedding material.

- Aggregate for soil cement bedding shall be either material selected from the excavation, imported material, or a combination thereof; be free of organic material and other deleterious substances; and meet the following grading requirements:

Sieve Sizes	Percentage Passing
37.5 mm	100
25 mm	80 – 100
19 mm	60 – 100
9.5 mm	50 – 100
4.75 mm	40 – 80
150 µm	10 – 40

- The aggregate, cement and water shall be proportioned either by mass or by volume. Not less than 175 kg of cement shall be used for each cubic meter of material produced. The water content shall be sufficient to produce a fluid, workable mix that will flow and can be pumped without segregation of the aggregate while being placed.

- Materials for soil cement bedding shall be thoroughly machine mixed in a pugmill, rotary drum or other approved mixer. Mixing shall continue until the cement and water are thoroughly dispersed throughout the material. Soil cement bedding shall be placed in the work within one hour after mixing.

- Soil cement bedding shall be placed in a uniform manner that will prevent voids in, or segregation of, the bedding, and will not float or shift the culvert. Foreign material which falls into the trench prior to or during placing of the soil cement bedding shall be immediately removed.

- Backfilling with earth on culverts set in soil cement bedding shall not commence until 8 hours after the soil cement bedding has been placed.

65□1.02A(1) Circular Reinforced Concrete Pipe (Designated or Selected by Class)

•□□□□□□□□□Circular reinforced concrete pipe designated or selected by Class shall conform to the requirements in AASHTO Designation: M 170M for the Class designated or selected except as provided in this Section 65□1.02A(1).

•□□□□□□□□□When the Class of circular reinforced concrete pipe is not shown or designated, the Class of pipe and the corresponding method of backfill shall be selected by the Contractor in accordance with the details shown on the plans.

•□□□□□□□□□When the Class of circular reinforced concrete pipe is shown or designated, the method of backfill shall be selected by the Contractor in accordance with the details shown on the plans.

65□1.03 Earthwork

•□□□□□□□□□Excavation, backfill and culvert beddings shall conform to the provisions in Section 19 □3, "Structure Excavation and Backfill," except at locations where pipe is to be backfilled with concrete, the backfill shall conform to the provisions in Section 65□1.035, "Concrete Backfill."

•□□□□□□□□□If non□reinforced concrete pipe is substituted for reinforced concrete pipe, excavation and backfill for the non□reinforced concrete pipe shall conform to the details shown on the plans for reinforced concrete pipe.

•□□□□□□□□□The pipe shall be laid in a trench excavated to the lines and grades established by the Engineer. The bottom of the trench shall be graded and prepared to provide a firm and uniform bearing throughout the entire length of the pipe.

•□□□□□□□□□Backfill of culvert pipe trenches may be partially completed or completed while the joint mortar is still plastic. Should the joint mortar become set before the backfill is placed, backfilling of the pipe trenches shall not be commenced within 16 hours of jointing the pipe sections.

From: Mulhearn, Mike
Sent: Tuesday, January 15, 2013 10:29 AM
To: 'Reddy.Penny@epamail.epa.gov'
Cc: Turner, Alison
Subject: RE: Evandale - Sanitary Sewer

I will forward your e-mail to Alison.

I don't have any ground water records for Evandale but a few years ago a drilling contractor drilled through the center of our City sewer main on Evandale near Leong. We excavated the area and replaced a 3' section of 15" clay sewer pipe. As I recall we had light ground water in our 10' –11' deep trench. I will be sending you the pdf map copies you requested later today.

Mike

From: Reddy.Penny@epamail.epa.gov [mailto:Reddy.Penny@epamail.epa.gov]
Sent: Tuesday, January 15, 2013 9:27 AM
To: Mulhearn, Mike
Subject: Evandale - Sanitary Sewer

Hi Mike,

Thanks for the taking the time to show me some of the video of the lines and explaining the utility maps in the area.

I reviewed the older plates of the sanitary sewer system (1953) to see if I could find what bedding material was used. I did not see any specifications. Allison mentioned she might know someone who is retired that might know the answer. Can you ask her if thats a possibility to check with that person if it was general practices in the 1950s to use native material as backfill or some other material (sand) when placing utilities?

If you could email PDFs of the F5 and F6 plates for sanitary sewer and storm water (2012 updated) when you get a chance that would be great.

A couple of more things I should have asked...

Do you know/have records if there were ever any significant repairs on the sanitary sewer at Evandale over time?
Is the water line at about 8 feet bgs along Evandale?

Thanks, Penny

Penny Wilson Reddy
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